# PATENT SPECIFICATION

(11) 1 338 452

1 338 452

DRAWINGS ATTACHED

(21) Application No. 31327/71 (22) Filed 5 July 1971

(23) Complete Specification filed 16 May 1972

(44) Complete Specification published 21 Nov. 1973

(51) International Classification B32B 3/18, 3/28//27/04

(52) Index at acceptance

B5N 17X 17Y 22X 249 251 252Y 254Y 255X 255Y 256 257 265Y 281Y 282X 282Y 297Y 344 348 352 353 354 357 35Y 439 55Y 574 57Y 583 584 601 609 60X 612 61Y 641 662 669 66Y 670 674 679 682 68X 690 694 715


(19)

## (54) IMPROVEMENTS IN OR RELATING TO REINFORCED FLEXIBLE PLASTICS SHEETING


(71) We FLEXIPANE LIMITED, a British Company, and MICHAEL GREENGRASS, a British Subject, both of Priory Works, Newton Street, Newton St. Faith, Norwich, Norfolk, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—


The present invention relates to reinforced plastics sheeting which is flexible in character and which is particularly, although not exclusively, suitable for temporary covering work, e.g. on building sites.

It is an object of the invention to provide improved sheeting of the general type referred to.

According to the present invention there is provided reinforced flexible plastics sheeting comprising two component sheets of flexible plastics material secured one over the other with elongated strips in the form of tapes or cords sandwiched therebetween, the elongated strips being retained in channels formed between the two sheets with freedom for movement along the said strip lengths.

It follows from such an arrangement that fixing of the sheeting in use by external anchoring of the strip ends is facilitated.

Conveniently the tapes or cords are of cotton, nylon, fabric or PVC.

Conveniently the component sheets are of polyethylene and they are secured together by heat welding.

Advantageously at least one of the said component sheets is itself formed from two sub-component sheets, with a reinforcement sandwiched substantially immovably therebetween.

Such an arrangement provides for enhanced strength by virtue of the reinforcement offered to at least one of the component sheets of flexible plastics material. The reinforcement may be either a mesh or a single strand and will of course not be movable in the manner of the strips which are movably sandwiched in the channels.

In accordance with a preferred method of forming sheeting according to the invention, the component sheets and the strips are fed in the required sandwich formation between a pair of rollers and heat applied, the regions occupied by the strips being maintained cool whereby welding does not occur in the said regions. It is in this way that channels are formed which retain the strips but do not anchor them against movement along their lengths.

In order that the invention may be more readily understood reference will now be made to the accompanying drawings which are given by way of example and in which:—

Fig. 1 illustrates in plan view a first form of plastics sheeting according to the invention;

Fig. 2 illustrates the sheeting of Fig. 1 in end view, with the component parts thereof somewhat exaggerated in relative size and location;

Fig. 3 illustrates in schematic end view a simplified machine for forming the sheeting according to the invention;

Fig. 4 illustrates in schematic plan view the simplified machine of Fig. 3; and

Figs. 5 and 6 show in plan and end view respectively a manner of sheeting reinforcement.

As shown in Figs. 1 and 2 a piece of plastics sheeting according to the invention comprises two component sheets of plastics material 1 and 2, which are laid one over the other with elongated strips in the form of tapes or cords of reinforcing material 3 sandwiched therebetween. Although in the accompanying Figs. the strips 3 are shown only in a single direction parallel formation, it is to be understood that this is by way of non-limiting illustration only. Thus it is

envisaged that a grid of mutually traversing strips may be provided or alternatively strips in the form of a continuous zigzag may be provided. It is further envisaged that various other unspecified dispositions of the strips may be provided to suit particular purposes and that the strip sizes and formations may vary over a single piece of sheeting.

In all cases, however, although the strips 3 are located in matching channels 4 formed between the two component sheets, the said strips are not secured with respect to the said component sheets and thus may be pulled through their channels. This is of particular advantage because over a substantial length of sheeting according to the invention the strips may exhibit a substantial degree of stretch and thus there may be a substantial amount of strip length gain. This is ideally suitable for fixing purposes.

In accordance with a preferred embodiment of the invention the component sheets are of polyethylene. The sheets of polyethylene may be of equal or unequal thickness and are generally welded together. It is however envisaged that they might be glued or otherwise fixed together. The tapes or cords are, as previously indicated, sandwiched between the two sheets and may run in their channels vertically or longitudinally, at various distances (equal or unequal) and at various angles to suit the various requirements encountered in building, civil engineering, mining, horticulture or other industries. The tapes or cords may be formed of any material such as textile, including cotton, nylon, fabric, PVC, or coated materials.

Movement of the strips may be in a horizontal as well as a vertical plane.

The methods of forming the sheeting according to the invention are legion but by way of example there is instanced and illustrated in Figs. 3 and 4 a particularly suitable method and means for achieving simple sandwiching of the sheets by welding them together by heat, with the strips residing in channels where welding has not been effected. The component sheets 1 and 2 are fed from reel sources 1*a* and 2*a* and strips 3 in the form of textile tapes are fed from a further reel source 3*a*. The three aforementioned materials pass between two rollers 5 and 6, and are heated by heating means 7. The heating means 7 are provided with shielding means 8, adjacent the regions of tape feed, so that although welding will take place between the sheets 1 and 2, it will not take place at the region of the tapes. Thus channels for the tapes will be formed and the aforementioned required characteristic will be met. Generally the feed of at least some of the materials is under gravity.

It is to be noted that various other methods and means of forming the sheeting according to the invention may be relied on. For instance a series of conventional machines of any suitable type may be used if desired.

Furthermore it is envisaged that either one or both of the component sheets may be reinforced by the provision therein of a mesh of crossing strands or a series of single e.g. parallel, strands of reinforcing material. Such reinforcements do not move within the component sheet and it is generally the case that they will be incorporated in the said component sheet by the sandwiching together of two individual sub-component sheets with the reinforcement therebetween. Such an arrangement is shown in Figs. 5 and 6. Thus in Fig. 5 there is shown an arrangement generally similar to that of Fig. 1 and in Fig. 6 there is shown an arrangement generally similar to that of Fig. 2. The difference however exists in that the component sheet 2 is itself formed from two sub-component sheets 2*a*, 2*b* between which is sandwiched a cross mesh 100 of reinforcing material. This cross mesh may if desired be replaced by single strands in parallel or similar relationship.

Such a reinforcement of the sheet 2 may alternatively be applied to the sheet 1 or may be applied to both the sheets 1 and 2, provided that such reinforcement does not interfere with the free movement of the strips 3 in the manner and for the purposes previously described. The reinforcing material 100 will of course itself not move with respect to the plastics sheeting.

WHAT WE CLAIM IS:—

1. Reinforced flexible plastics sheeting comprising two component sheets of flexible plastics material secured one over the other with elongated strips in the form of tapes or cords sandwiched therebetween, the elongated strips being retained in channels formed between the two sheets with freedom for movement along the said strip lengths.

2. Sheeting according to claim 1 wherein the tapes or cords are formed of cotton, nylon, fabric, or PVC.

3. Sheeting according to either of the preceding claims wherein the component sheets are of polyethylene and are secured together heat welding.

4. Sheeting according to any of the preceding claims wherein at least one of the said component sheets is itself formed from two sub-component sheets, with a reinforcement sandwiched substantially immovably therebetween.

5. Sheeting according to claim 4 wherein the said reinforcement is in the form of a mesh or plurality of single strands of reinforcing material.

6. Sheeting according to claim 5 wherein

the said reinforcing material comprises elongated threads of plastics or similar material.

7. A method of forming sheeting according to any of the preceding claims comprising the steps of feeding the component sheets and the elongated strips in the required sandwich formation between a pair of rollers and applying heat, the regions occupied by the strips being maintained cool whereby welding does not occur in the said regions.

8. Sheeting when formed by the method according to claim 7.

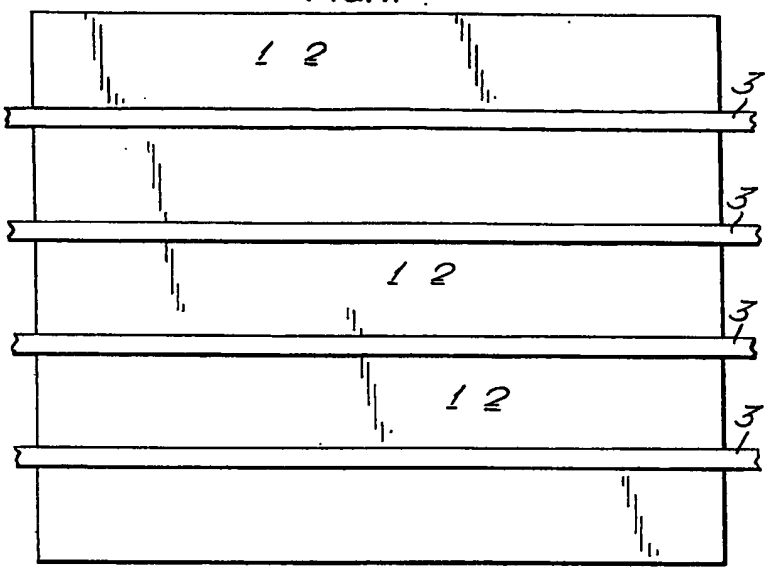
9. Reinforced flexible plastics sheeting substantially as described herein with reference to the accompanying drawings or when formed by a method substantially as described herein with reference to the accompanying drawings.

POTTS, KERR & CO.

Printed for Her Majesty's Stationery Office by the Courier Press, Leamington Spa, 1973.
Published by the Patent Office, 25 Southampton Buildings, London, WC2A 1AY, from which copies may be obtained.

1338452 COMPLETE SPECIFICATION
2 SHEETS This drawing is a reproduction of the Original on a reduced scale
Sheet 1

FIG. 1.



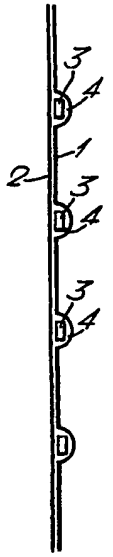




FIG. 2.

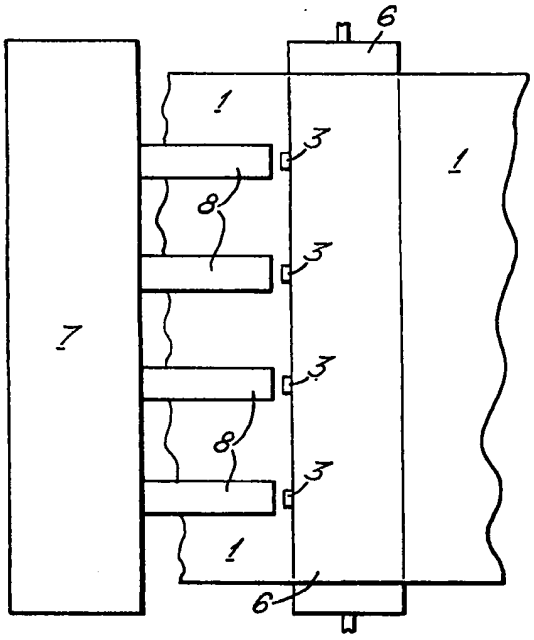
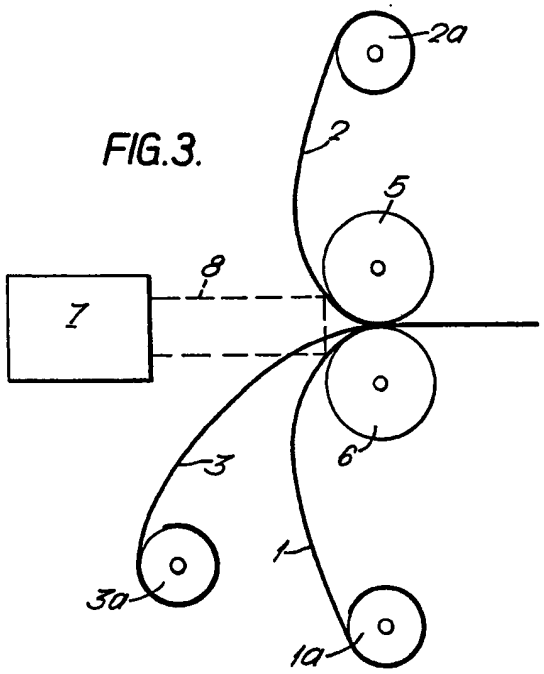



FIG. 4

1338452 COMPLETE SPECIFICATION
2 SHEETS This drawing is a reproduction of the Original on a reduced scale
Sheet 2

FIG.3.



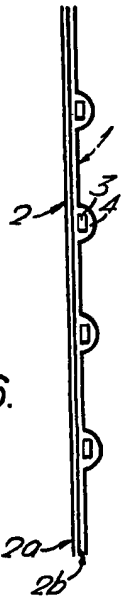




FIG.6.

FIG.5.